School Shop

vol. VIII no. 6

FEBRUARY, 1949

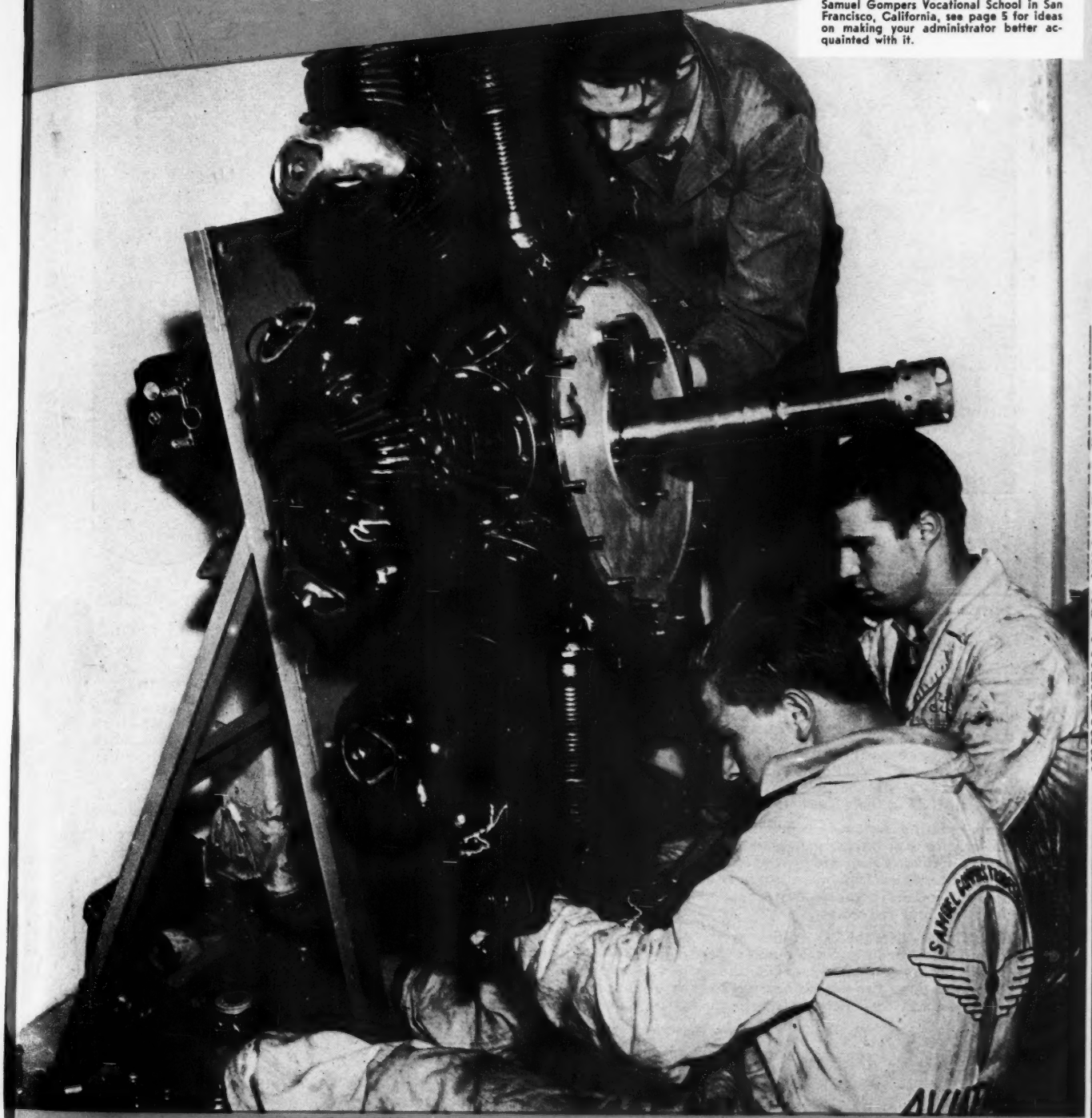
How to Educate Your Superintendent
by J. W. Giachino

Pop-up Letters with Acrylics
by R. Lloyd Cantor

Souvenir Axe
by Conrad Johnson

Shop-Made Portable Bleachers
by Doren and Dreyer

On the cover: If you have a good industrial-education program like this one at Samuel Gompers Vocational School in San Francisco, California, see page 5 for ideas on making your administrator better acquainted with it.



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School Shop

FOR INDUSTRIAL EDUCATION TEACHERS

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School Shop TALK

COMMENTS ON ISSUES FACING INDUSTRIAL EDUCATION

The UN and Shop Teaching

At first glance there seems to be little connection between the United Nations and your shop teaching. One is concerned with global problems while the other is concerned with teaching young people the objectives of the industrial-education program.

Yet global problems affect every community in the United States and even penetrate the confines of the school shop. Here is one path of penetration.

The world is an economic unit. Nations are dependent to a greater or lesser extent on one another. Even the United States, rich in resources and resourcefulness, is dependent on other countries. Tin and rubber are two examples of raw material needs which have to be filled from sources outside this country. Paper is another commodity which we import in large quantities.

These items are used every day in the school shop. So are wax from South America, lacquer and tung oil from the Orient. The list is extensive.

We don't need to steal the thunder of the social-studies teachers, but it is an easy matter to throw in an occasional aside to the affect that it is important for us to get along with the people who supply these imports. They, in turn, need to get along with us so they can buy our automobiles, radios, and other exports. Every nation's standard of living goes up as a result of such reciprocal transactions.

The United Nations is the organization that can help to keep things on an even keel in the global give and take. It deserves an occasional plug from the shop teacher and his point of departure can be made from materials found in every school shop.

For the correlation minded there is a real opportunity to work out with the social-studies department an interesting and significant unit on the economic interdependence of nations as illustrated by the materials in the school shop. Some social-studies teachers would welcome the opportunity to utilize this approach. The shop teacher with vision will invite such cooperative action and take the initiative in promoting it.

We talk a good deal about this sort of thing, but are woefully weak in carrying it out. Correlated action with other school departments will help to buttress the position of the industrial-education program and serve to make all education in the school more meaningful.

For Want of a Nail . . .

Good teaching can be stifled and sometimes strangled outright by niggardly policies in regard to supplies and small equipment items. Some school administrators and boards of education take great pride in pointing out to visiting firemen, the shop facilities in the system. They neglect, however, to mention that, while the shops may be beautifully equipped, the budget for supplies and expendable tools and materials is so low that teachers are seriously hampered in their work.

A master teacher may have developed teaching technics that call for certain materials and supplies but never have a chance to use these technics because year after year he is told there is no place in the budget for items he requests.

This penny-wise and pound-foolish policy seems doubly ridiculous when the total costs of the industrial-education program are considered. School shops cost money to equip. The outlay in most shops runs into thousands of dollars. Teachers' salaries are usually the largest single item in a school budget. How myopic to spend large amounts on these two items and then not give the teacher the proper supplies with which to work to best advantage!

No forward-looking manufacturing establishment, no up-to-date engineering office, no modern hospital would think of hamstringing its professional workers by neglecting to give them the modest supplies they need to do the best possible job. Yet in his peregrinations your editor frequently hears complaints from teachers on this score and he hears them too frequently to think that such cases are isolated.

The far-sighted administrator will sell his board of education on the idea that it is foolish to set up excellent shop facilities, pay teachers fairly decent salaries, and then fail to give them the supplies with which to do a top-notch job. The youngsters suffer because good teaching is made difficult.

Your Editor

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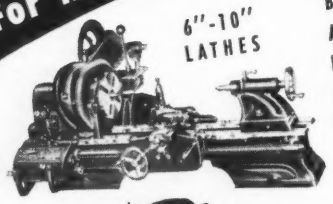

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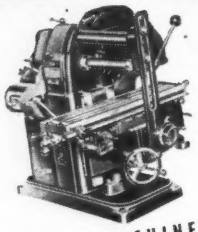

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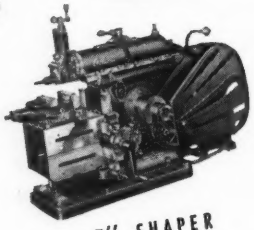

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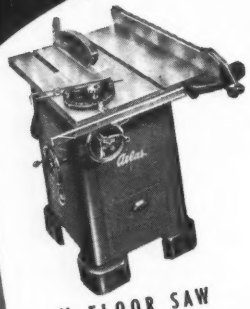

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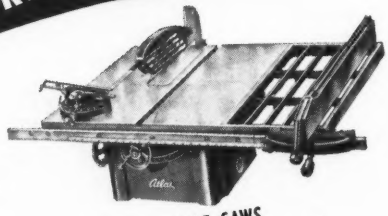

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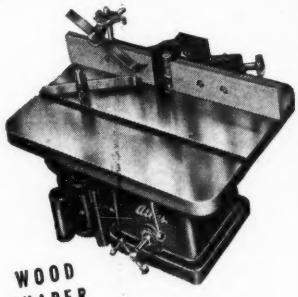

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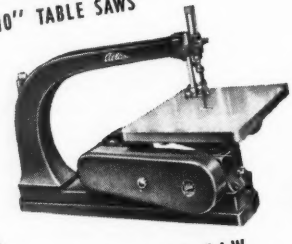

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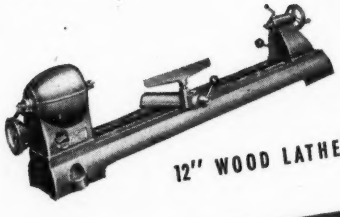

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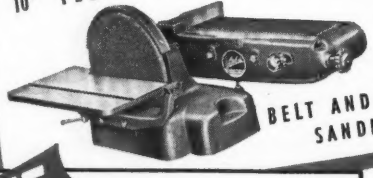

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How to Educate *Your Superintendent*

By J. W. Giachino

You can help to overcome that gap in the knowledge which superintendents and other administrators have of vocational and practical-arts education. Here is a realistic program for bringing to them an understanding of the principles and needs of modern industrial education. J. W. Giachino is Professor of Industrial Education, Western Michigan College of Education, Kalamazoo.

TOO often school leaders, due to their academic backgrounds, have not acquired the fundamental concepts of the industrial world in which they live. If they had gained clearer perceptions about living in a highly technical society, then possibly they would be more fully aware of the type of education needed by the great majority.

An understanding of a social order that is highly industrialized necessitates a sound philosophy of vocational and practical-arts education. Unquestionably this field is of paramount importance since it provides the avenues that lead to successful living. It is not inferred that the academic phases of our general education program are not important. They are extremely necessary. But, unless they become mixed with some of the practical elements essential for modern living, then many youngsters will continue to be denied a decent education.

Technical Training Neglected

Unfortunately most students of school administration while in institutions of higher learning are never exposed to any form of technical education. It is exceedingly rare to find prospective school administrators who have taken professional courses in vocational and practical-arts education. Yet, these same individuals eventually will administer a vocational and practical-arts program. It is true that in larger school systems there is a supervisor or director whose responsibility is to look after this area of the school's program. Nevertheless, if a principal or superintendent had a deeper insight into the philosophy of vocational and practical-arts education, the development of this area for the good of all students would be greatly enhanced. On the other hand, small school systems may not have supervisors or directors, and the administration as well as the supervision falls on the superintendent and principal. Unless he possesses some of the basic concepts of vocational and practical-arts education it is difficult for any administrator to do much constructive supervision, let alone appreciate the need for the development of this phase of the educational program.

As a rule, most school leaders have had an excellent philosophical background in the other areas of their academic program. They can talk intelligently and offer constructive leadership in the social studies, sciences, language arts, etc. But it is amazing and provoking to find so many of the same people without even a layman's knowledge of the simple terminology of vocational and practical-arts education. It is not unusual to find school administrators, for example, still referring to industrial education exclusively as manual training. Their only knowledge of industrial education is that it consists of a shop where manipulative work goes on and *a place to which something can be sent for repair.* As to their understanding the difference between vocational-industrial education, industrial arts, and the other areas of practical-arts education, that is entirely beyond their comprehension.

Basic Knowledge Necessary

It is not essential for school administrators to have practical experience in vocational and practical-arts education. But certainly they should have acquired a fundamental philosophy of this type of education if they are to understand its place and function in an educational plan. Somewhere in their graduate work there should have been provided some of the significant phases of vocational and practical-arts education, either in a specific industrial education course, or as a part of one or more general education courses.

Many of our more able administrators will readily admit their deficiency in this area and wish that they were better able to understand it. Some, of course, through their own initiative are attempting to gain a more thorough knowledge of it. However, it is extremely doubtful if much progress can be made unless those of us in vocational and practical-arts education initiate a definite plan to educate school administrators.

We should first of all prevail on all institutions of higher learning to require school administrators to acquire a basic philosophy of vocational and practical-arts education. This may be difficult to achieve, but constant prodding from people in the field should produce some positive response.

Everyone's Job

Every vocational and practical-arts teacher should assume the responsibility of seeing that leaders in their respective school systems fully understand the principles of vocational and practical-arts education. Such an undertaking may be accomplished in a number of ways. Here are a few possibilities:

1. *Arrange a series of meetings with your principal and superintendent and discuss what you are doing in your particular teaching area.* During these conferences make it a point to present some of the fundamental concepts of the whole field of vocational and practical-arts education and advise them how you are currently attempting to achieve these essential objectives. Be prepared to talk intelligently and fluently about some of the problems involved in meeting the needs of students and what vocational and practical-arts education can contribute towards solving a few of the immediate needs of your community. Do not attempt to get across all the necessary information in one sitting. Rather, map out a definite campaign and drive home some significant theme during each meeting. If you can carry out a carefully planned strategy your superiors are bound to be influenced and consequently will gain a better perspective of the whole technical field. Moreover, they will welcome this knowledge and you can rest assured that they will be more sympathetic with what you are doing. At least you will get them thinking in a direction that may eventually lead toward a more constructive educational plan.

2. *Review carefully current literature in the field of vocational and practical-arts education.* Use a red pencil and encircle the more important paragraphs. Then send this information to your school administrators with a note saying the attached materials may be of interest to them. Especially be on the lookout for

writings which deal with life-adjustment education and other topics concerning education for an industrial age. Occasionally it will be advisable to append some remark or suggestion as to what you think your school might do. Make it a rule to send such information regularly even though you feel that all of it may not be read.

3. *Avail yourself of every opportunity to invite the superintendent and principal to visit your shop.* Help them see what is going on; put on demonstration lessons; interpret the activities that are taking place in terms of the philosophy of your field. Call their attention to any unusual achievement of your students. Go so far as to help them design a rating device to measure the effectiveness of your work. By doing these things you are, paradoxically speaking, using the back door as a means of getting across the needs of vocational and practical-arts education.

4. *Persuade the principal to allow you to bring in some individual to teachers' meetings who can talk about vocational and practical-arts education.* Arrange a number of such meetings each semester and be certain that the superintendent is invited.

Have a Campaign

Undoubtedly many other devices can be employed to educate school administrators. The important thing is to undertake a very definite campaign and continue it until you are certain it has achieved its desired purpose. Plan such an educative program as diligently as you would a series of lessons for your students. Use every trick, aid, or tool that is feasible to put across this information. If every vocational and practical-arts teacher can do this, then many of our present educational "ills" may in time be minimized.

Educators recognize a correlation between the worth of an educational program and the quality of its leadership. The leadership, in turn, is directly influenced by the nature of its training and experience. Those school administrators who are fortunate enough to develop a sound educational philosophy together with a broad understanding of economic and social implications for living will be likely to meet adequately the educational needs of youngsters. Where this philosophy and this understanding have not been developed, there is danger that these failings will be reflected in an inadequate educational program for the community in which the supervisor operates.

The present concern is for the "other 60 percent" who do not receive an education which is adequate to prepare them for life. The National Commission for Life Adjustment Education has been established to study this problem. It is seeking ways and means of encouraging schools with traditional curriculums to make more adequate provisions for the 60 percent. It seems to me that the solution to this problem would be simplified if more school administrators had a clearer understanding of the basic philosophy for successful living.

Leaders (?) in Industrial Arts Education

By Marcus Fitzgerald

Extracurricular Phil

"Him? Oh, he's the shop teacher—I think."

EXTRA-CURRICULAR Phil believes that a sure way of becoming a high-school principal as well as the idol of the student body is to be deeply involved in the extra-curricular activities of the school. He starts new clubs and societies and revives those which were about to die a natural death.

His shop has fallen into an ill state of repair due to lack of time and attention. He hasn't had time as yet in his three years at the school to organize his instruction. Phil finds it necessary to leave his shop classes frequently in order to meet with the yearbook editorial staff, or to discuss stage scenery with the dramatics staff, or to check on the progress of the plans for the annual carnival.

The pupils in the shop work without the benefit of systematic instruction. When the teacher is absent from the shop the electric power is off as it should be but those who need to use machines are forced to be idle.

Extra-curricular activities have come to constitute an important segment of most school programs but the instructor's primary contribution should be made through his area of instruction. If the extra-curricular activity has educational merit it deserves an assigned part of the teacher's school day.

Make Friends with Your Postman!

THAT'S what we said. Become his pal, ask about the wife and kids, etc. It is to your advantage to get on the right side of him. He is going to be carrying a very valuable item in his sack come April. *What is it?* It's the biggest and best Directory and Planning issue of SCHOOL SHOP ever. You are no doubt using past Directory and Planning numbers with their super lists of suppliers, book lists, planning sections. This one will be better than any you've received before. We needn't remind you, then, to make sure you get your April SCHOOL SHOP. If the postman decides he likes it so well he wants it for himself, don't say we didn't warn you.

Pop-up Letters with Acrylics

By R. Lloyd Cantor

Here is an exciting technic in using plastics that will fascinate students and serve to illustrate one of the unusual properties of the acrylics. R. Lloyd Cantor is Professor of Fine and Industrial Arts at West Virginia Institute of Technology, Montgomery, and visiting faculty member at Columbia University, New York City.

Project applications of the "pop-up" technic.

TESTED PROJECT

MORE and more industrial-arts teachers are including plastics in their shop work and rightfully so! If industrial arts is to provide an orientation to the industrial and technological world in which we live, then plastics should have its place in every program.

There are new materials made available to industrial-arts teachers every day which are fascinating challenges. Fluorescent and phosphorescent plastics, every conceivable color, transparent, translucent, mottled and iridescent plastics can be used. New shaping, bending and carving devices, molding, casting, and laminating equipment can be had for the industrial-arts laboratory.

As one new project suggestion, *Pop-up Letters with Acrylics* is offered here.

Lettered signs and name plates can be made in many ways in plastics. Among the possibilities are inlaying, overlaying, stenciling, piercing, and engraving. However, here is a new and fascinating way.

1. *Obtain a raised metal stamp spelling out the desired copy.* One can be made from large type (72 or 60 point). Individual metal letters can be purchased from most handicrafts suppliers.

2. *Secure the letters in a chase or mount on a piece of wood or metal.* Purchased letters may be fastened to wood by first soldering pins to the back of letters. Letters may even be carved in bas-relief on a piece of wood stock.

3. *Select a piece of acrylic plastic of approximately ½" thickness; the length and width may be determined by the size of the letter-copy.* Lucite and Plexiglas are ideally suited. Edges and surfaces should be polished and clear.

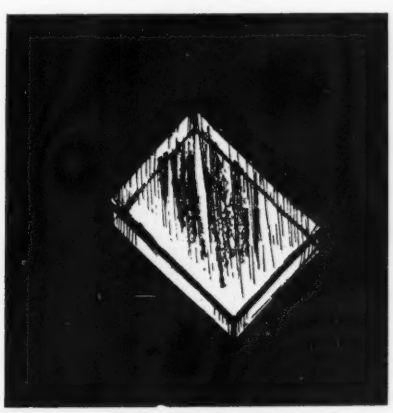
4. *Heat the acrylic stock.* If the stick of letters is of metal which will take heat, then heat this plate, too. Acrylics can be heated in boiling water, with a nichrome wire heater, or an infra-red or ordinary incandescent bulb. Direct flame heat can also be administered if used with care.

5. *Heated plastic and letter-plate should now be clamped together in a woodworking vise.* As a safety factor, use gloves when handling heated acrylics. If lettered plate is to be heated, use a hand-vise to avoid burning hands.

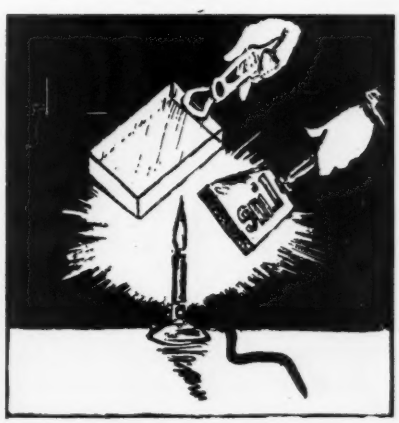
6. *When plastic and plate are cool, remove from vise.* A duplicate of the let-

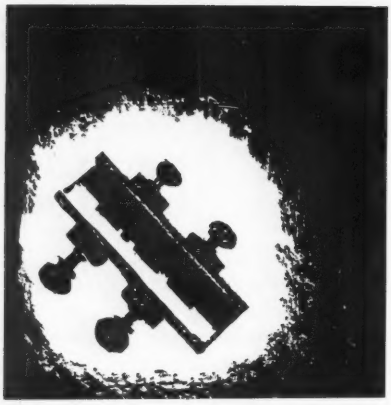
Step 2—Metal stamp.

Step 3—Acrylic plastic.



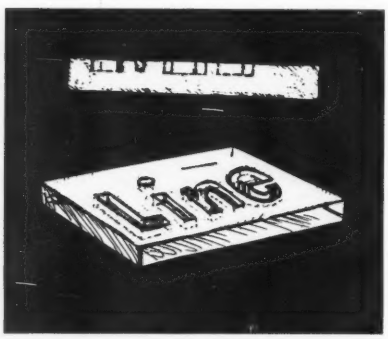
Step 4—Any heating method may be used.





Step 5—Any clamping device may be used.

ter impressions will be found in the plastic stock. Water may be poured on plastic to speed casehardening and cooling. From the smooth and unimpressed side of the plastic sheet, the letters are now visible in three-dimensional attractiveness. The sign may be left this way or



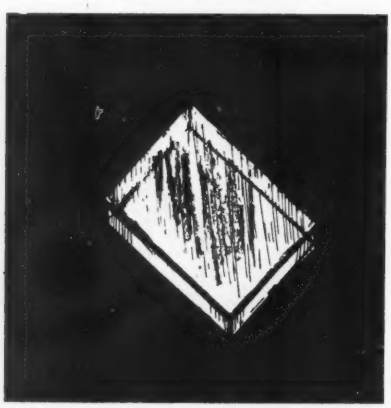
Step 6—Cooled plastic after impression.

filled with Burgess inlay filler, dental amalgam, liquid silver solder, or paint may be "wiped in." But if the student desires a novel experience:

7. *Remove all trace of the impressed letters by cutting away the plastic com-*

(*Continued on page* 14)

Step 7—Plastic after being trimmed down to depth of impression.



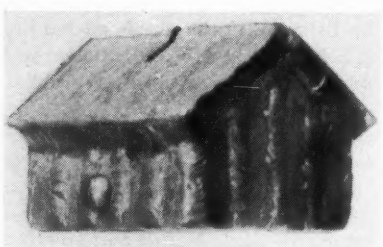
A Welded Coin Bank

By M. O. Johnsen

Here is a good beginning project for welding classes. M. O. Johnsen is Assistant Professor of Industrial Arts, Kent, Ohio, State University.

A HANDICAP to the teaching of welding to beginning students is the lack of simple projects. These should be simple enough so that the beginner will have an opportunity to utilize technics in welding, but not so difficult that he will be forced to attempt to move beyond his level of attainment without sufficient instruction. In addition, if the learning experience is to be a worthwhile one, the project must hold his interest throughout.

A project that has successfully met these demands is the coin bank illustrated below. The beginning welding student knows at the outset of this job that he will have a useful product when he finishes and that each welding exercise is basic to his learning. Three welding exercises are involved in making the bank: butt welding without rod, butt welding with rod, and fillet welding. A piece of hot rolled strip steel, $\frac{1}{8}$" x $\frac{1}{2}$", 5′ in length is needed for the project. Approximately the same length of welding is made.



Side view of the bank with detachable bottom. Note screw in side to hold bottom piece to sides.

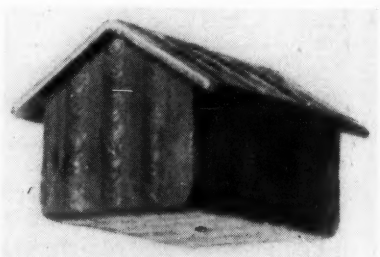
Bottom view of bank with detachable bottom.

The strip should be cut in the following pieces:

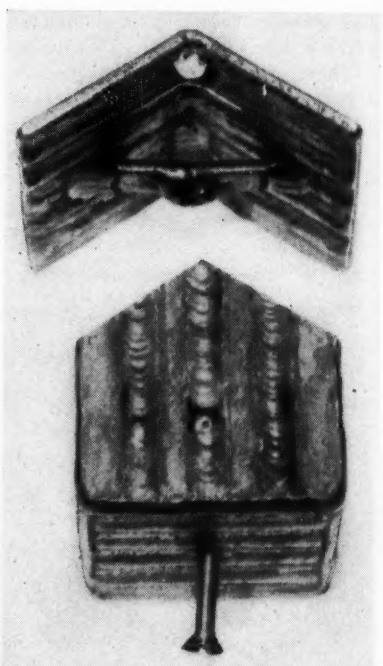
12 pieces $\frac{1}{8}$" x $\frac{1}{2}$" x $1\frac{5}{8}$" for the roof
5 pieces $\frac{1}{8}$" x $\frac{1}{2}$" x 2" for the bottom
10 pieces $\frac{1}{8}$" x $\frac{1}{2}$" x $1\frac{1}{4}$" for the sides
8 pieces $\frac{1}{8}$" x $\frac{1}{2}$" x 2" for the ends

Procedure for Welding Bank

1. Butt weld roof and bottom pieces without rod.
2. Butt weld side and end pieces using rod.
3. Cut end pieces so that roof will fit body.
4. Weld together sides and ends of bank.
5. Weld together two roof pieces. Determine which way you wish to put the bank together so that it can be opened. Suggested methods: (*a*) making the roof detachable by welding a nut to the underside of the roof and extending a screw through the bottom to hold the roof in place, and (*b*) welding the roof to the sides and making the bottom detachable. This may be done by welding to the bottom two pieces, each $\frac{1}{8}$" x $\frac{1}{2}$" x $\frac{1}{2}$", in such a manner that they may be fastened to the inside by screws (see photo).
6. Weld either the roof or the bottom to the sides (see step 5).
7. After assembling, cut a slot for coins.



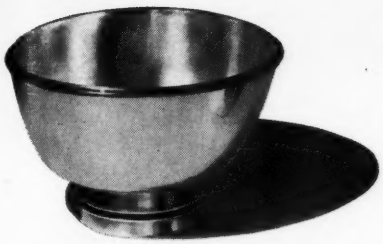
Side view of bank with detachable roof. Note screw in bottom which holds roof.



Bottom view of bank with detachable roof.

Make a Silver Bowl

By Margret Craver



Silver bowl constructed through use of the "thickened edge" method as shown below.

Silversmithing is a fascinating handcraft that calls for skill in design and execution. Here is a basic technic as reported by Margret Craver, consulting silversmith and Director of the Craft Service Department, Handy and Harman, New York City.

BEGINNING with an 8" circle of 22 B&S gage sterling silver, the graceful bowl shown in the photograph can be handwrought by the skilled shop teacher or student. Patience and skill are needed to fabricate such an article, but the result well justifies the time spent in the making.

Shop teachers can demonstrate and give practice in the artisanship of the silversmith with relatively simple projects like this one. Silversmithing is an important handcraft today and yet serves to illustrate the kind of work carried on in the one-man shop of craftsmen before the industrial revolution changed many of our production technics. The correlation of this type of work with the social studies is obvious.

As will be noted from the illustrations, three angles are developed in the forming of the bowl. Each angle, however, is made up of two or more courses, depending on the sharpness of the angle.

The bowl illustrated is made by the technic called the "thickened edge" which is the basic method for beginners. It was demonstrated by William E. Bennett, one of England's leading silversmiths, at the first Silversmithing Workshop Conference for teachers held at the Rhode Island School for Design under the sponsorship of Handy and Harman, refiners and dealers in precious metals, during August, 1947.

The thickened edge technic is a kindly teaching approach to forming by which students learn how to work with the material, rather than against it. An unusual variety of objects such as cups, bowls, ladles, pitchers, vases, and others can be made with this method which gives strength and richness to an exposed edge. It can be used with or without a decorative wire and gives greater latitude in design than other methods.

Mr. Bennett resigned as a young man from the staff of court jewelers and silversmiths to become a teacher at the College of Arts and Crafts in Sheffield, England. Both Mr. Bennett and British silver manufacturers believe that complete knowledge of the material is essential to both designers and workmen in the industry. The approach, therefore, is through developing trained hand craftsmen, as well as skill in machining processes such as stamping, drawing, and spinning. The artisan approach develops a cultural interest, they contend, and often uncovers talent in design.

The technic has been demonstrated in a sound and color film entitled *Handwrought Silver* which is available for distribution to classes in schools and colleges from Handy and Harman.

A second workshop conference was held in August, 1948, at the Rhode Island School of Design at which Baron Erik Fleming, Court Silversmith to His Majesty, the King of Sweden, was instructor.

1. Working diagram with angles indicated for development of the bowl.

2. Thickening the edge with a collet hammer after blocking the silver circle into a form only ½" deep. Thickening takes place 11 times, just before annealing, during the making of the bowl.

3. Development of the first angle as shown in 1 above. The numbers 1-4 show how the silver is brought up with each hammering from the base which is called a "course."

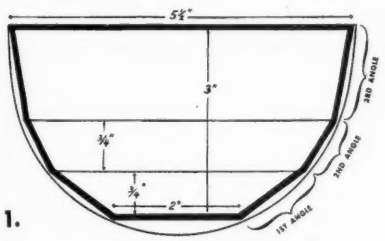
4. Raising the second angle.

5. Development of the third angle which requires only two raising courses.

6. First raising course in development of the first angle, showing position of highly polished steel stake, silver, and raising hammer. Thickening the edge and annealing are done after each course throughout the process.

7. Malleting out the angles on a curved steel stake that nearly matches the bowl contour.

8. Bouging, using a hammer that is only slightly domed, smooths the form by eliminating marks. Planishing with the flat face of the planishing hammer brings the surface to that beautiful perfection which handwrought silver should have.



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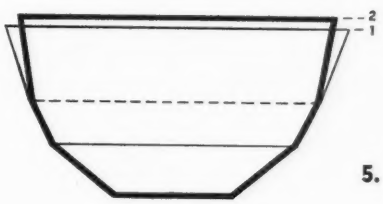

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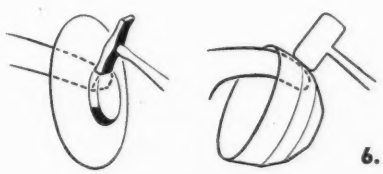

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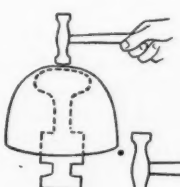

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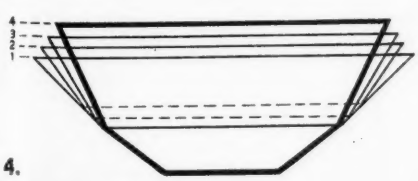

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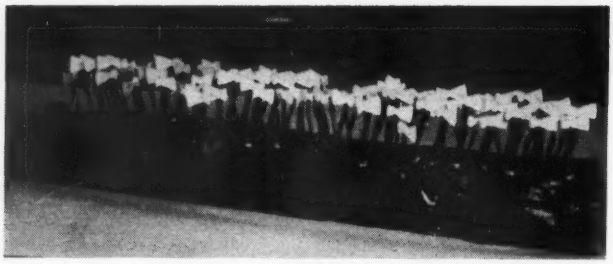


The axes arranged for distribution by inserting the handles in holes drilled in a log.

Souvenir Axe: A Miniature Production Job

By Conrad Johnson

Frequently the school shop can dramatize its work by producing a project like the axes described here. In addition, this type of activity serves admirably to demonstrate mass-production methods. Conrad Johnson teaches at the Trenton, N. J., State Teachers College.

TESTED INSTRUCTIONAL PROJECT

HERE is a project that can be used to show how industry "mass produces." It was undertaken in connection with the preparation of a club program with a Lincoln's Birthday motif. The program consisted of an arts and crafts display and discussion. Because its date coincided with Lincoln's Birthday, the "axe" idea seemed apropos.

When the axes were finished, a piece of red string was looped around each axe head so that the souvenir could be worn on the lapel during the program. For an appropriate method of distribution, the axes were placed in a halved log into which many holes had been bored.

At the conclusion of the craft program, each member of the audience was requested to examine his axe thoroughly as three of the souvenirs had been painted with red, white, and blue paint. Each person who discovered these colors on his axe was given a hand-made prize as an additional souvenir of the evening's program.

The successive steps involved in the making of the miniature axes are indicated by the sketches and photographs. (Because the main objective was the rapid production of 150 axes, little thought was given to the appearance of the actual jigs used and no attempt was made to "dress up" the job when the pictures were taken.)

The first step, of course, involved some planning. Decisions as to size, color, and production methods were made, after which materials were obtained, some jigs made, and the first pieces cut. These were for the axe heads and were cut from poplar ¾" x 1" x 8" in such a manner that the grain ran from head to edge. This eliminated the tendency for the pieces to split, especially after the hole for the handle had been bored.

Photo 1 shows the ¾" x 1" x 8" strips being cut on the circular saw with the table tilted to approximately 77° and with the blade protruding about ¾" through the table. After an identical cut was made on the other side of the strip, the blade was lowered and the fence adjusted so that the angle cuts could be made for the head part of the axe, as shown in photo 2.

To get the rounded effect as appears in drawing 2, each piece was rubbed with a sharp cabinet file as in picture 3. The rounded effect on the heads and cutting edge was produced as shown in photo 4 by applying the strips to the belt sander and rocking them slightly.

The next step was to separate the individual heads from the strips which was done with the usual set-up on the circular saw, and shown here in photo 5.

Drawing 5 and photos 6 and 7 show how each head was drilled to receive the handles. As can be seen, a simple jig, slightly less in thickness than the axe head, was taped to a handscrew clamp which was correctly positioned and secured to the drill-press table. The depth stops were adjusted to regulate the depth of the holes. It was then merely a matter of opening the clamp slightly, inserting the heads, tightening lightly, and applying the drill.

The shape of the handle is indicated in drawing 4. To make this, the top edge of the handle was drawn on the edge of a 2" x 6" block of wood and the scrap pieces removed on the jigsaw. After the cut, finger-gaging as in photo 8 produced the other line of the handle. The 2" wide slabs ⅛" thick were cut off in quantity. Photo 9 shows the slab being cut with a saber blade. All lines for succeeding handles were drawn by finger-gaging from the previous cuts.

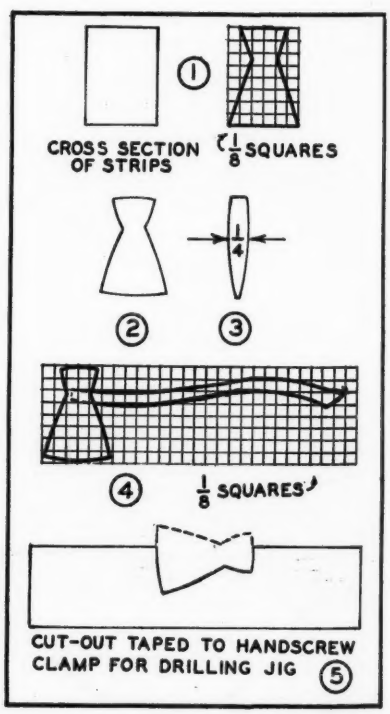
The slabs were next sanded, using a portable sander held in an inverted position in a vise. This machine was used in preference to the regular pedestal type because the radius of the pulley of the portable machine was just about right to accommodate the curves of the handle.

By the use of an improvised ripping jig on the jigsaw, the slabs were reduced to individual handles, as in photo 11. Each handle was then rubbed lightly with sandpaper to round and to remove any "whiskers" left by the sawing, and the pieces were next dropped into a can of stain to color them.

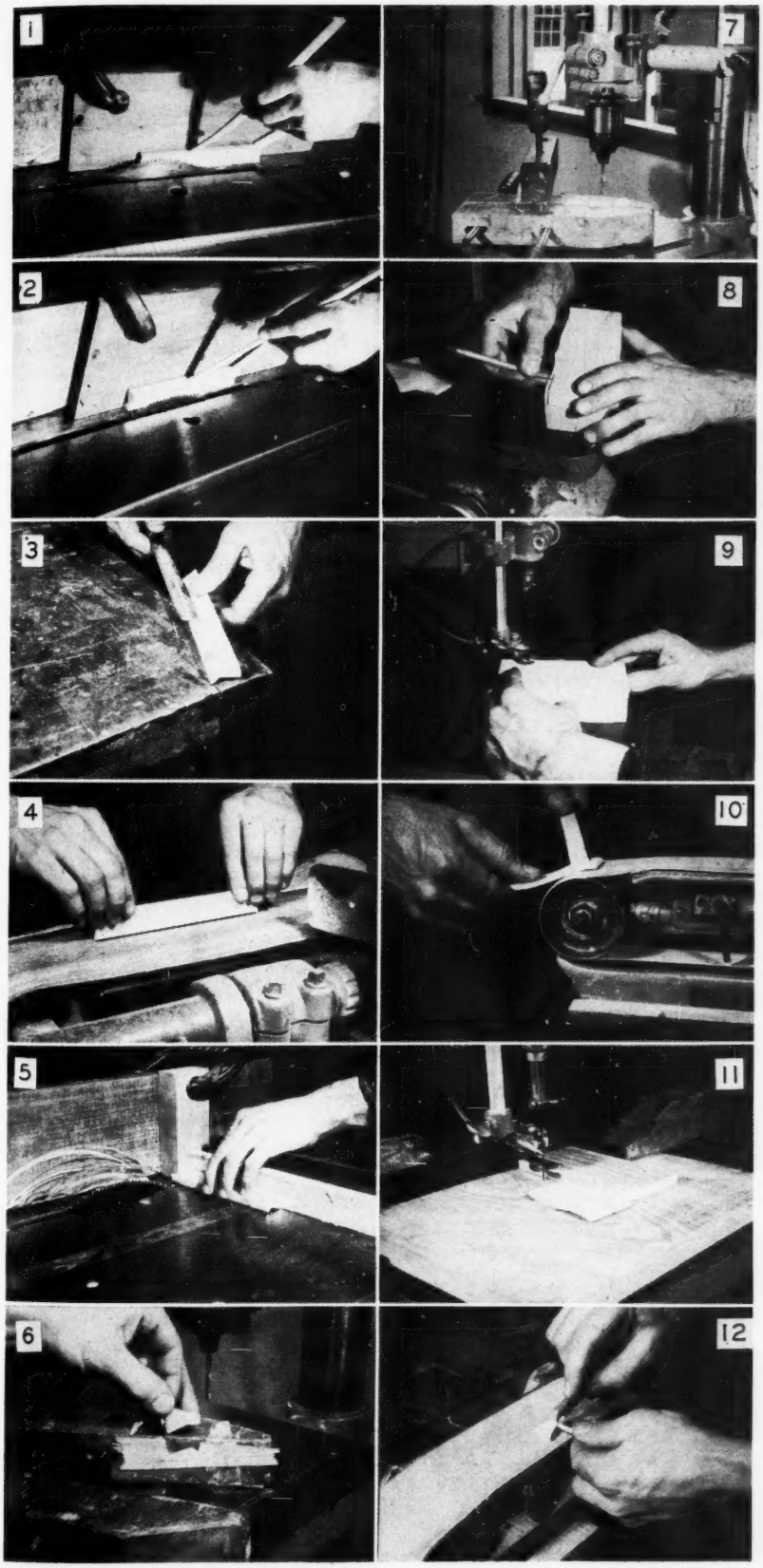
On being removed from the stain, the handles were spread out on a piece of newspaper to dry, after which they were inserted into the heads. A dab of glue was sufficient to hold them in place securely since the holes were bored for a snug fit.

With the handles in place, the heads were next applied to the sander again to produce the contour of the sides of the axe heads as is shown in sketch 3.

The final operation in the construction of the project was that of painting the heads. This was done with a quick-drying aluminum paint which produced an effective coloring.



Jig and Fixture Set-up for Axe Production Job

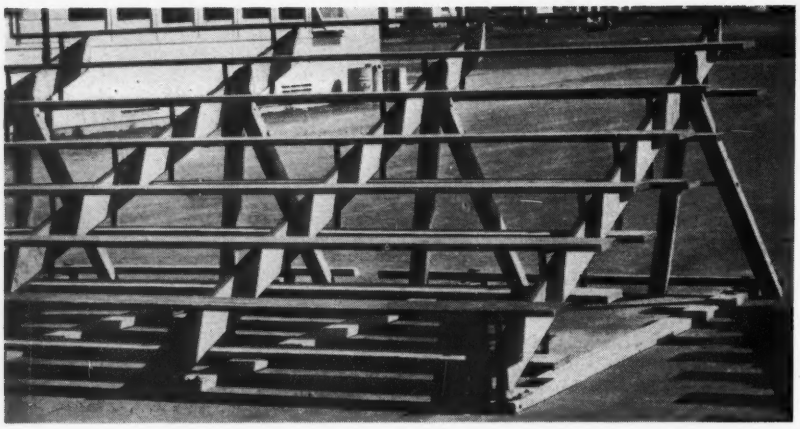


1. Cutting strip for axe head.
2. Making angle cut with saw tilted.
3. Rounding edges with cabinet file.
4. Rounding outside edges on sander.
5. Cutting off individual axe heads.
6. Placing head in jig for drilling.
7. Drilling holes for axe handles.
8. Finger gaging for handle cut.
9. Cutting handles on jig saw.
10. Sanding curves on belt sander.
11. Cutting handles with ripping jig.
12. "Grinding" edge on miniature axe.

Strictly Personal

ABOUT YOUR FELLOW TEACHERS

THE new president of the AVA, E. L. WILLIAMS, teacher-trainer at Texas A & M College, College Station, will be succeeded as AVA vice-president representing industrial education by J. C. WOODIN, director, Industrial and Adult Education, Wichita, Kans. . . . Newly appointed California state director of vocational education is WESLEY SMITH. . . . LESLIE V. BALLARD has been named Oklahoma state supervisor of trade and industrial education. . . . The assistant director of the Dunwoody Institute in Minneapolis, Minn., RALPH T. CRAIGO, retired recently after 34 years at that institution. . . . The Rhode Island state supervisor of trade and industrial education, RAYMOND W. PERRY, died recently at the age of 65. . . . Newly appointed instructor in printing at Carnegie Institute of Technology, Pittsburgh, Pa., is GEORGE J. MILLS. . . . Among the new faculty members at California, Pa., State Teachers College are IRVIN J. SHUTSY, who teaches advanced woodworking, architectural drawing and design, curriculum materials, and is supervisor of student teachers, and MERRILL CAMPBELL, instructor in electrical shop. . . . WALTER C. KLINGENSMITH, a teacher in the Somers Trade School, Pittsburgh, Pa., died recently. . . . The Eugene, Ore., Vocational School's instructor in photography, CHESTER STEVENSON, retired recently. . . . The former Oklahoma state supervisor of trade and industrial education, E. P. CHANDLER, is now an assistant in teacher training in the department of trade and industrial education at Oklahoma A & M College, Stillwater. . . . The new head of the teacher education department at A & M is F. GLENN SMITH.



Finished bleacher section on the school playfield. Note the sturdy construction as safety was a major consideration in design.

Shop-Made Portable Bleachers

By John E. Doren and Charles Dreyer

Student stimulation resulted in the following project which illustrated production technics and correlated the work of several shops. The bleachers are a worthwhile shop contribution to the school community. John E. Doren teaches woodworking and Charles Dreyer teaches metalworking at the Senior High School, Eureka, California.

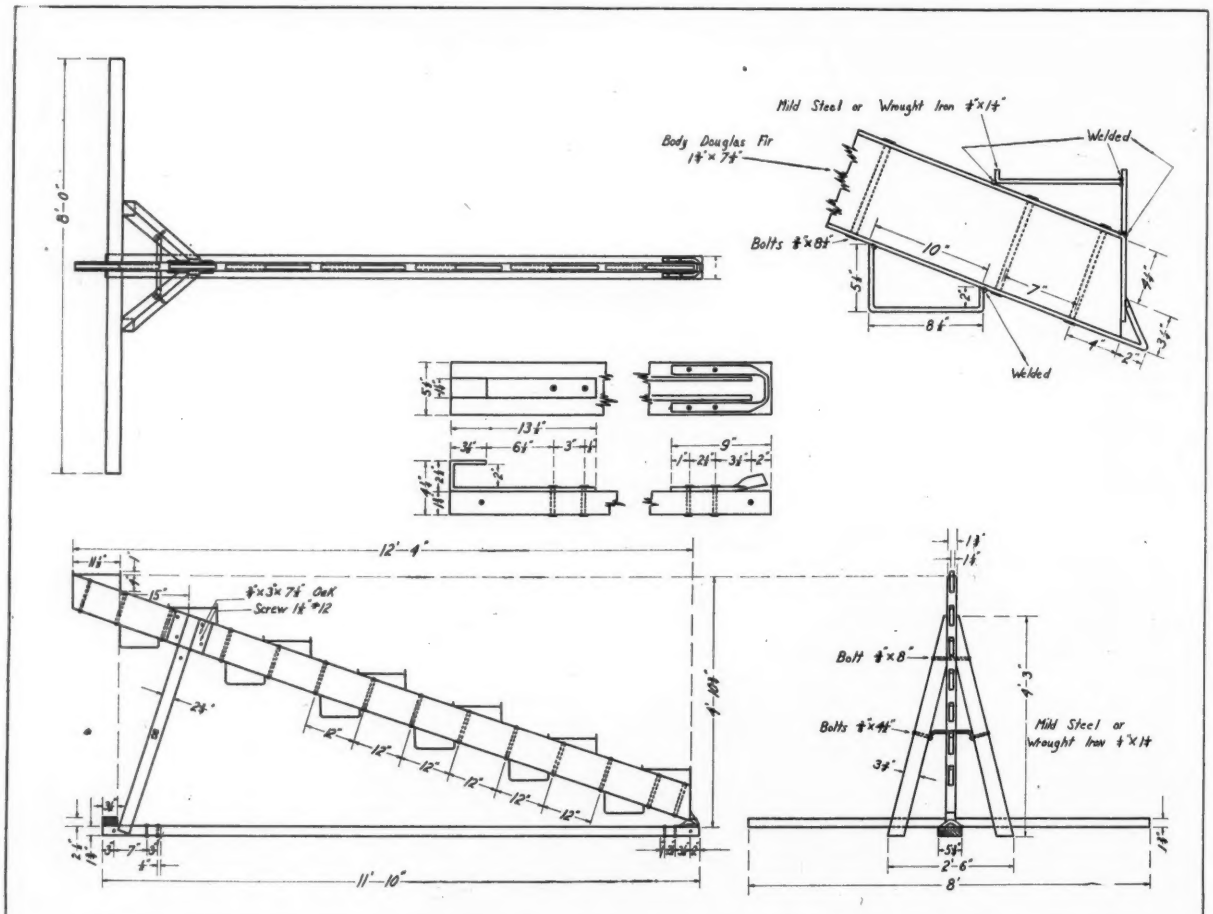
TESTED INSTRUCTIONAL PROJECT

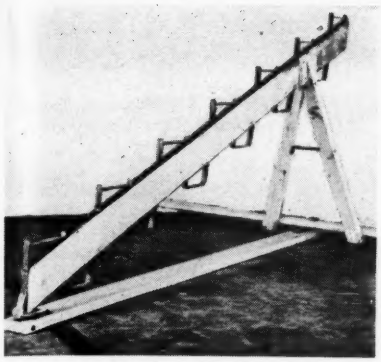
STUDENT-BODY leaders in our high school decided that the people attending the basketball games were not adequately taken care of as far as seating arrangements were concerned. More portable bleacher seats were urgently needed for use in the gymnasium or out on the athletic field it was felt by the Student Body Council which placed the problem in the hands of the woodworking and metalworking departments of the school.

It was decided that this assignment could be set up on an industrial production basis to illustrate production technics and give the students some practice in this type of activity.

Safety was a major consideration, of course, particularly because the newspapers had been carrying stories of serious accidents which had occurred when bleacher seats had collapsed. Therefore, strength and safety were made first considerations.

Our first step was to send students to the gymnasium to measure the floor and determine the maximum size of the bleachers for the area available. From this information it was decided that it was possible to provide eight units 16'





View of the support frame showing the metal band bolted to the top and bottom of the "horse" planks.

long and seven seats or tiers high. For safety, it seemed wise to provide four support frames for each unit.

Working drawings were then prepared and a list of lumber made out. Clear spruce was the first choice, but as there was none available we had to take clear, vertical-grain, green Douglas fir. This could only be secured as rough lumber.

Following is the lumber that was needed:

"Horses," 32 pieces—1¾" x 7½" x 14'-0"
Baseboards, 32 pieces—1¾" x 5" x 12'-0"
Kick Boards, 16 pieces—1¾" x 3" x 8'-0"
"A" Frames, 32 pieces—2¾" x 3¾" x 10'-0"
Seat Boards, 56 pieces—1¼" x 9½" x 16'-0"
Foot Boards, 48 pieces—1¼" x 7½" x 16'-0"

As only rough lumber was available, we had to do all the surfacing and sizing in the school shop. We were not able to get 3" x 4" lumber for the "A" frames, so we had to take 3" x 8" and 6" x 8" pieces, and do the resawing and ripping ourselves.

As soon as the material reached the school shop, one group of students was given the task of resawing and ripping the heavy material for the "A" frames. This was done on the 36" band saw with a 1½" band-saw blade.

Another group of students was given the task of double surfacing the "horse" planks by passing them twice through a 36" single surfacer. All of the pieces were first surfaced on one side. As soon as the pieces began to come through with the second surface completed, another group of students was assigned the job of truing one edge on the 16" jointer and passing the pieces on to another group who ripped the pieces to size at the circular rip saw. Other students then laid out the length and marked the ends and sawed the ends by hand. The parts were then passed on to the metal-working shop to have the metal bands applied.

After the heavy lumber for the "A" frames had been ripped and resawed, the parts were sent to the jointer where one side and one edge were trued up. The parts were then passed through the planer where they were cut down to the required size. In the meantime, a pattern had been prepared for the shape of the legs of the "A" frame. The sized parts were then marked and cut to shape and length on the band saw. The parts were then sent to the metalworking shop to have the metal hardware attached.

The seat boards and the foot boards were then double surfaced, one edge jointed, and all parts ripped to the desired width. The rough edges on all pieces left rough by the rip saw were smoothed on the jointer and the edges then rounded lightly by hand to get rid of the sharp arrises that might easily splinter. Beginning students rounded the edges with 16" jack planes.

In the metal shop, two long pieces of steel, ¼" x 1½", were clamped together and the holes laid out to take the ⅜" x 8½" bolts that were to hold these bands to the "horses." While these were still clamped together, they were drilled and laid out to receive the extra parts that were to be welded to them. The two bands were then separated and used as templates for the drilling and the marking of all top and bottom bands so that all parts were identical.

All of the small extra parts were

For More ACCURATE JOINTING OF LONGER STOCK

BOICE-CRANE
NO. 1420 SIX-INCH JOINTER

Tables on the Boice-Crane are 5" longer than most others, for the accurate jointing of 25% to 50% longer stock, and the fence is 33" long (10" longer than most others). The ONLY fence that is 100% rigid, permits steady guiding and accurate cuts through the full length of even heavy 12-foot doors and sash. Unskilled operators get perfect results and more output because they can give entire attention to feeding the stock.

The only 6-inch jointer with quick acting fence locks at *both* ends. Even six times ordinary feed pressure cannot spring fence sidewise nor up on right angle or bevel cuts.

The 2¾" diameter cutterhead has a 3" diameter cutting arc, the largest in any low-priced 6-inch jointer, for freer cutting "rake-angle" to knives, for a chatterless and much smoother shearing cut rather than the chipping and chattering cut common to smaller diameter cutterheads. Cutterhead and bearings will withstand speeds up to 5500 r.p.m.

Features a double-pivoted cutterhead guard, which when rabbeting, is not bodily removed from the machine (usually the case) but swings down and out of the way, remaining immediately replaceable when conventional jointing is resumed, thus reducing the chances of failing to return guard to position.

Dual fence controls BOTH at operators fingertips.

Floor cabinet has motor compartment and dust chute.

4 models, belt or direct motor drive, bench or floor type.

SPECIFICATIONS:

Overall length: 43½".
Tables: 6" wide x 36" long.
Fence: 33" long x 3⅜" high.
Max. width of cut: 6".
Depth of cut, max.: 9/16".
Cutterhead: 2¾" dia. 3 knives.

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sheared to length. Those parts that were to be bent were all bent cold. The bending was done around metal or hardwood forms so that all parts were reasonably alike. These small parts were then clamped in position and welded.

The top and bottom bands were placed in position on the "horses" and the bolt holes marked. The holes were then drilled through the plank half way from each edge. The drilling was done with a portable electric drill and a jig was used to guide the drill.

As soon as the "horses," the "A" frames, and the base boards were completed, the support frames were set up and tested out to make sure that the parts could be quickly set up without the use of any tools.

The job of building these portable bleachers began on a Monday morning. There were four woodworking classes of 20 boys each; each class worked for one hour a day. There was one class of metal workers made up of 20 boys who worked for four hours per day. The entire job was done by Thursday noon, just three and one-half days.

Convention Calendar

February 13-17, **National School Service Institute,** Palmer House, Chicago.
February 16 and 17, **Oklahoma Trade and Industrial Education Association.** Central High School, Oklahoma City.
March 3-5, **American Society of Training Directors,** Hotel Carter, Cleveland, Ohio.
March 17-19, **New Jersey Vocational and Arts Association,** Asbury Park.
March 23-26, **Western Arts Association,** Dallas, Tex.
March 24-26, **Illinois Vocational Association,** Peoria.
March 24-26, **Ohio Industrial Arts Association,** Hotel Deshler-Wallick, Columbus.
April 6-9, **Eastern Arts Association,** Hotel Statler, Boston, Mass.
April 14-16, **Texas Vocational Association,** San Antonio.
April 18-21, **National Vocational Guidance Association,** Stevens Hotel, Chicago, Ill.
April 20-22, **New York State Vocational and Practical Arts Association,** Albany.
April 21-23, **Michigan Industrial Education Society,** Civic Auditorium, Grand Rapids.
April 21-23, **Indiana Industrial Education Association,** Turkey Run.
May 7 and 8, **Wisconsin Association of Vocational and Adult Education,** Hotel Schroeder, Milwaukee.
May 12-14, **American Industrial Arts Association,** St. Louis, Mo.
June 22-24, **Pennsylvania Vocational Association,** Eagles Mere.

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L-44
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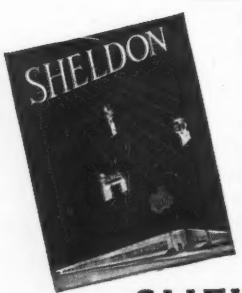

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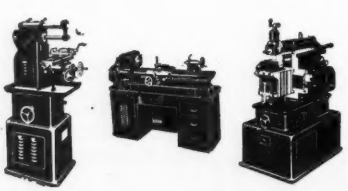

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Manufacturers of Sheldon Precision Lathes • Milling Machines • Shapers
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Acrylics . . .

from page 8

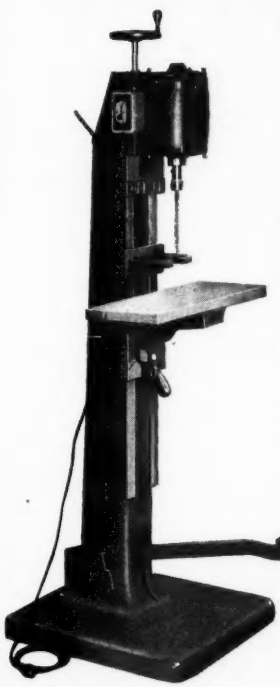
pletely down to the depth of the letters. If the letters were impressed ¼" down into the ½" stock, shave off that ¼" so that no trace of the letter impressions is visible. Use a plane, file, or sander.

8. *Heat the remaining ¼" flat stock and the letters will reappear and "pop-up" to their former height of ½".* These letters will stand up in bold relief and will return to their former position qualities possessed by all acrylics.

Letters will, of course, be in reverse (if metal stamps are used instead of type) and will have to be viewed from the smooth side. It will be found appealing that way! However, metal letters for the mold may be turned upside down and mounted in reverse, which will then, of course, produce letters in proper reading order on the pop-up side of the plastic. The easiest alternative is to use printers' type.

High-school youngsters were permitted to examine a piece of previously prepared plastic and which appeared to be a regular smooth piece of ¼" stock. It was then heated and popped up before their eyes.

"OLIVER" No. 194B Single Spindle BORER



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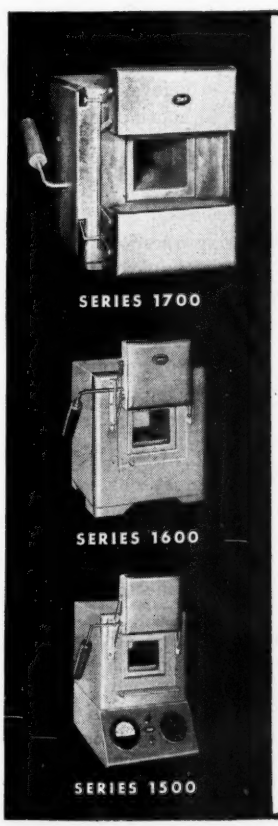

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Teaching Tools

POINTERS ON INSTRUCTION and SHOP ADMINISTRATION

By John F. Nowak

The Art of Questioning

A SPECIAL skill at which shop teachers show a common weakness is that of the art of questioning. Failure to develop this skill means that a poor teaching job will be done, no matter how well the shop class is otherwise conducted.

Three factors lead to successful questioning: (1) form, (2) distribution, and (3) stimulation of thought and reasoning power.

Form. The best questions are those which are simply stated. Questions requiring qualifications or restatement should be avoided. Points to keep in mind are:

a) Each question should be in complete sentence form.

b) They should be phrased in language the students will understand.

c) They should be specific and should contain only one idea.

Question Box

As a complement to this department, readers are invited to send in questions which relate to methods of teaching shopwork. If a personal reply is desired, include a stamped, self-addressed envelope. Send questions to:

John F. Nowak
Postoffice Box 869
Church Street Station
New York 8, N.Y.

d) Snap answers should be discouraged by the phrasing.

e) No indications concerning the answer should be given in the question.

f) They should not be ambiguous.

Distribution. It seems to be an almost natural tendency for teachers to insure correct answers in a hurry by calling on students who have given evidence of knowing the answers. This leads to domination of the class by a few students. Points to keep in mind in regard to question distribution are:

a) Try not to overwork the bright students. Direct your question to the class as a whole at first, pause a few seconds to allow the question to sink, then call on a pupil for an answer.

b) Call on students so as to cover all members of the class. Do not, however, use an alphabetized list or seating plan. Skip around among all students in seeking answers to questions.

Stimulation of thought and reasoning power. The most desirable questions are those which require the student to think and to reason out before he can give an answer. Points to consider are:

a) Adapt questions to varying levels of ability in your class.

b) Discourage group answering.

c) Avoid using questions which may be answered by a simple "yes" or "no." Begin your questions with such phrases as "What would happen," "Why does this," "How can we," "Which method," "When will," etc. Remember that key starting words for thought-provoking questions are Who, Which, What, Why, When, Where, How, etc.

d) Encourage questions by students. Remember that a question asked by a student is evidence that he is thinking, that he is perplexed, that there is a felt need to which you can supply an answer.

Questions and Answers

Q. Under what conditions is group instruction desirable? (L. M.)

A. (1) During initial lessons.

(2) While imparting information from which the entire class may profit.

(3) In subject matter in which common errors are made.

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NEWS

What's Doing in the Field of INDUSTRIAL EDUCATION

C. M. Miller Honored

THE annual citation of the Ship, organization of firms doing business in the vocational education field, was given to Charles M. Miller, director of the Kansas State Board of Vocational Education, at the Ship's party held in Milwaukee at the time of the American Vocational Association convention. The tribute stated that the citation was given because of "Your enthusiastic devotion to the great profession of teaching, your educational contributions as lecturer, consultant, and author, your enduring faith in our industrial education program which recognizes individual creative thinking and doing as vital factors in our American way of life. . . ." The presentation was made by Bert Cholet of the Higgins Ink Co., captain of the Ship.

Illinois Moves Ahead

AT least 15 schools in Illinois this school year have established industrial-arts programs where none existed before or, if they had existed, had been discontinued for various reasons. This same pattern is also in evidence throughout the nation as the value of industrial arts is demonstrated to administrators and school boards.

Training Directors Meet

THE fifth annual conference of the American Society of Training Directors will be held at the Hotel Carter, Cleveland, Ohio, on March 3-5. Representatives from throughout the nation will meet to discuss the problems of training programs as carried on by industry. An attendance of approximately 1000 is expected.

Printing Teachers Elect

AT a recent meeting of the Printing Teachers Guild of New York the following officers were elected: president, David M. Teichler; vice-president, Frank DiGiacomo; secretary, Harry Lazar; treasurer, Samuel Ettinger.

Ohio Vocational Association Convenes

HOLDING its first meeting since the end of the war, the Ohio Vocational Association assembled at Columbus on December 29-30. A business meeting, banquet, and sectional discussions were held. Ralph Harner of Xenia is currently president of the association.

Officers Named

NEW officers of the National Council of Local Administrators of Vocational Education and Practical Arts were elected at the meeting held in Milwaukee at the time of the AVA sessions. They are as follows: president, Howard E. Marvin, Pasadena, Calif.; vice-president for local directors, Frank Huffaker, Chattanooga, Tenn.; vice-president for trade-school principals, Wm. E. Rasche, Milwaukee, Wis.; secretary, Albert E. Jochen, New Brunswick, N.J.; and treasurer, W. K. Begeman, St. Louis, Mo. New members of the executive committee are J. F. Rees, Harrisburg, Pa.; L. H. Bates, Tacoma, Wash.; R. K. Britton, Denver, Colo.; Violette O'Reilly, New Orleans, La.; and M. E. Siegel, New York, N.Y.

Unesco in Afghanistan

UNESCO has been invited to send an educational mission to Afghanistan to survey education in that country with special emphasis on technical and vocational education. The survey is to be made this spring and probably will take about three months. A report will be published on completion of the work which was authorized at the time of the Unesco meeting in Beirut, Syria, in December.

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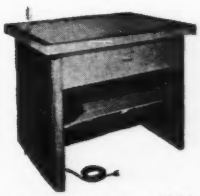

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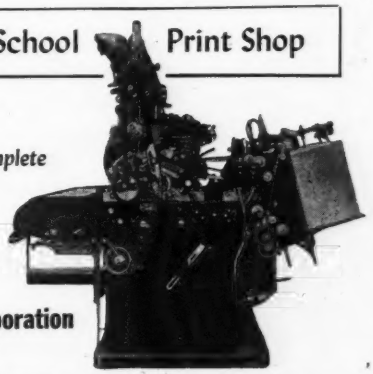

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School Shop KINKS

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Cleanup Hint

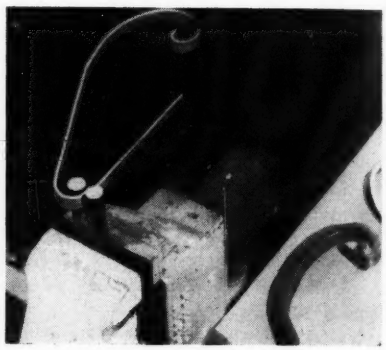
It is possible to get around the difficulty of cleaning under school shop benches when they are built close to the floor with short legs. Cut ¾" pine boards to fit the space. When these are in place no more dirt can get under the benches. Shellac the boards with two coats in a color to match the benches. Cleanup time can become much more pleasant, smoother-running, and thorough. The shop teacher's nightly checkup will also become more brief and satisfactory. And, of course, there will be an improvement in relations with the custodial staff.—*Fred M. Kilbourne, Memorial High School, Pelham, N.Y.*

Soldering Secret

The teacher in metalworking or in general shop can make use of this trick for soldering on a wall or ceiling which is overhead. Not even all professional solderers know it. Simply prepare the soldering iron with sharp edges on the "facets," tin the iron, then de-tin the edges by rubbing them with a rubber eraser. The puddle of solder will stay where it belongs if this is done.—*Stan Schirmacher, Cottonwood, Ariz., High School.*

"Boy Proof" Jig

I have found that eighth- and ninth-grade boys are capable of breaking almost any jig. The one reproduced below is a simple one and will withstand much abuse. It consists of two round bars, either ½" or ⅝" and 5" long, separated by two short pieces of ⅛" band iron and welded together. Weld one piece at the end of the bars and the other about 1¼" from the opposite end.



This jig has many uses, particularly that of starting the small end of a scroll. If the metal tends to slip, it may be held tightly by inserting a flattened piece of band iron from the opposite side. You can use either the open or the closed part of the jig.—*William B. Doose, North Hollywood, Calif., Junior High School.*

Save (Sand) Paper

A method for saving on sandpaper consumption in the shop consists of merely tearing large sheets into eight small pieces, each 2" x 4". At first this may bring complaints from the classes, but a trial will show that they get as much use from the small sheets as they formerly did from the large ones. In my classes the quality of work has not decreased since I started this procedure, but I find that sandpaper goes twice as far.—*Fred E. Hamilton, Follansbee, W. Va., High School.*

To Cut a Bottle

To cut a glass bottle or jar, first fill the vessel with cold water which has been thickened with earth or flour to a point ⅝" from the place where the cut is needed. Next, pour in boiled paraffin up to the level of the desired cut. Because of the action of hot and cold liquids there will be an unequal expansion and a break will result at the desired level on the glass or jar.—*I. M. Fenn, Chicago, Ill., Vocational School.*

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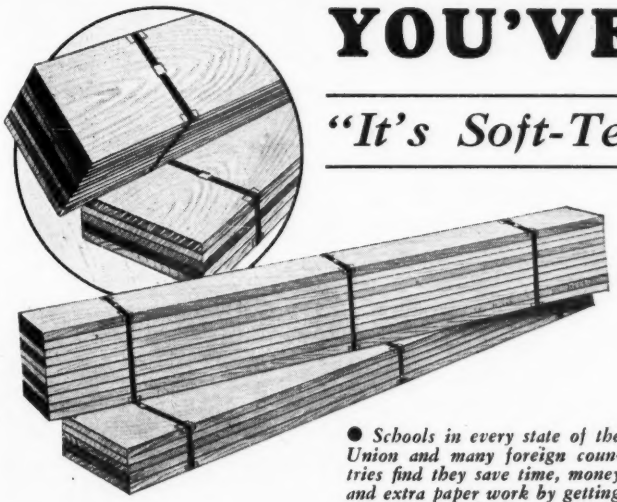

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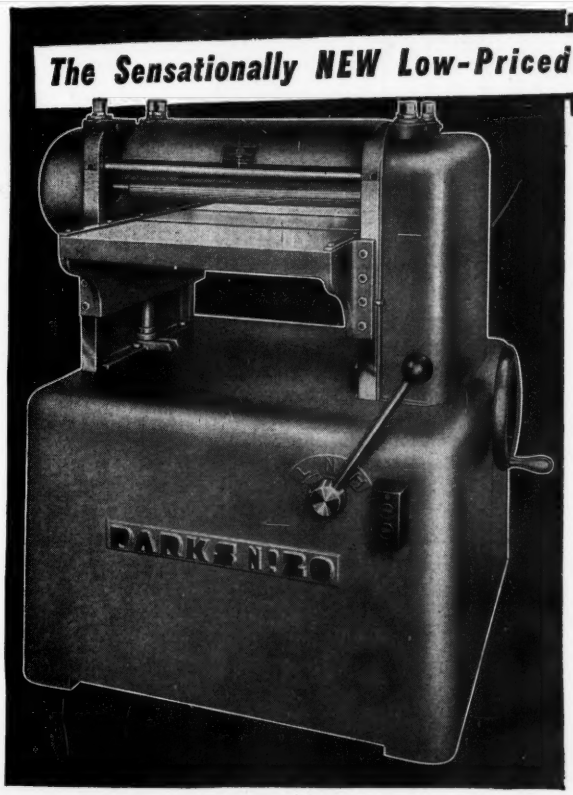

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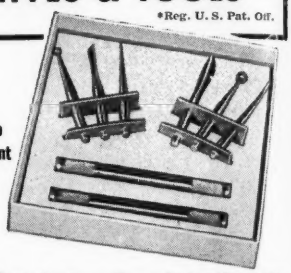

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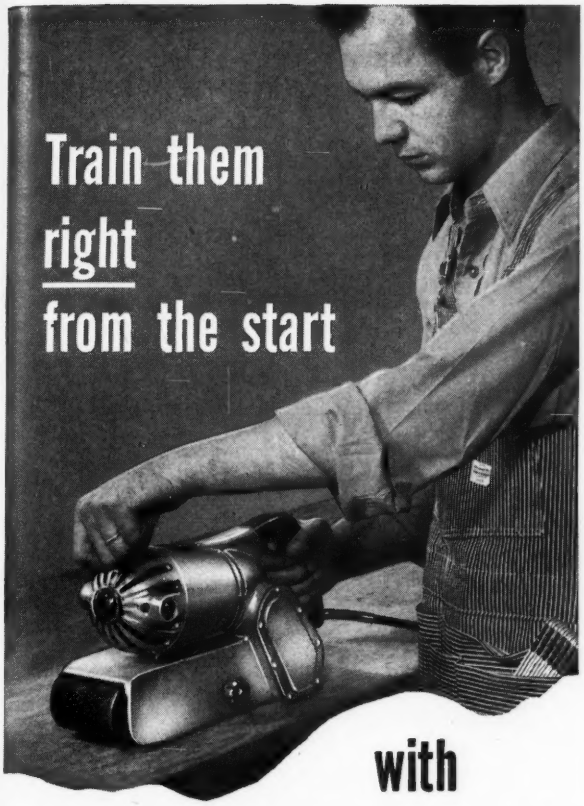

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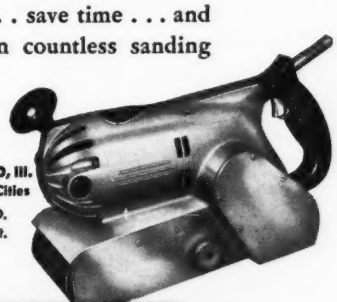

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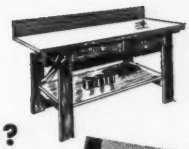

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"Combination Teaching" Surveyed in Wisconsin

By Stuart Anderson

What "combinations" occur when shop teachers instruct in other fields in the secondary-school curriculum? How many subjects does each combination teacher handle? Which type of school is more likely to require combination teaching? Teacher-training institutions and students will want to know the answers. Stuart Anderson is an Assistant Professor at the Stout Institute, Menomonie, Wisconsin.

RESULTS of a recent survey of teachers in Wisconsin secondary schools provide information which should be of particular interest to institutions which are preparing students in industrial education and to students preparing to teach in that field. The survey indicates the types of teaching combinations among industrial-arts teachers in the state.

Approximately 50 percent of a sample of shop teachers in the state responded to a questionnaire designed to give information of the number and kind of secondary-school subjects taught in addition to industrial arts. Examination of the survey data reveals that approximately 80 percent of the industrial educators taught shop subjects exclusively (see Table I). Of those responding to the questionnaire, 14.1 percent taught one subject in addition to industrial arts. Nearly 5 percent taught two additional subjects, according to the results in the sampling.

TABLE I

TEACHING COMBINATIONS OF WISCONSIN INDUSTRIAL-ARTS TEACHERS

Additional Subjects Taught	*Distribution*	
	Number	*Percent*
None	187	79.6
One	33	14.1
Two	11	4.6
Three	3	1.3
Four	1	0.4
Total	235	100.0

A breakdown of content of the teaching load disclosed that the subjects taught most frequently by those industrial-arts teachers in the sample who indicated they taught other subjects were science and mathematics (see Table II). Social studies and physical and health education, followed by English and speech, music, art, and agriculture were less frequently taught in combination. There were no responses indicating that commercial subjects or foreign languages are taught in Wisconsin secondary schools by industrial-arts teachers.

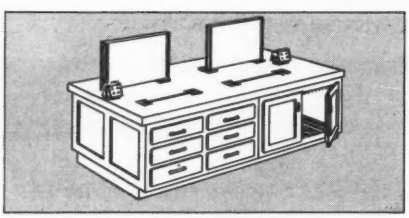
TABLE II

SUBJECT COMBINATIONS TAUGHT BY WISCONSIN INDUSTRIAL-ARTS TEACHERS

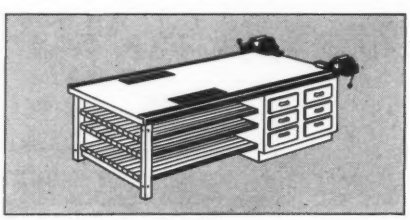
	Additional Subjects Taught				
Subjects	*One*	*Two*	*Three*	*Four*	*Total*
Science	7	8	1	1	17
Mathematics	10	6	0	1	17
Social Studies	5	1	3	1	10
Physical and Health Education	6	1	1	1	9
English and Speech	0	1	2	0	3
Music	0	1	1	0	2
Art	2	0	0	0	2
Agriculture	0	1	0	0	1
Others	3	3	1	0	7
Total	33	22	9	4	68

The survey did not reveal that a rela-

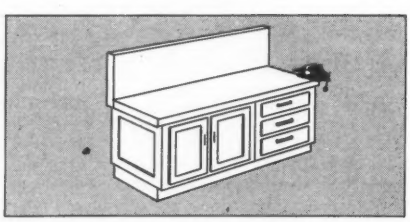
(*Continued on page 24*)



Wiring Bench



General Shop Bench



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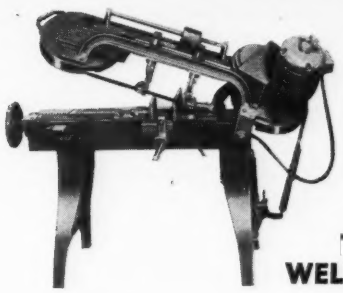

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Combination . . . *from page 22*

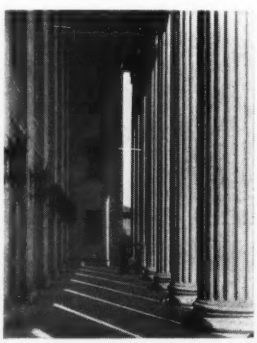
tionship existed between the number of years of teaching experience and subject combinations. One might guess that the combination problem occurs chiefly in small high schools. This is not borne out by the survey in Wisconsin. Teaching combinations were quite widely distributed among the large and small high schools, according to the sample data. The largest number of teaching combinations was found in four-year high schools, with the junior-high schools next. The six-year high schools and the three-year high schools had the smallest proportion of industrial-arts teaching combined with other fields.

TABLE III

DISTRIBUTION OF TEACHING COMBINATIONS IN INDUSTRIAL-ARTS TEACHERS BY TYPE OF HIGH SCHOOL

Kind of High School		*Distribution* *No.*	*Percent*
Junior High	7-8-9	47	20.1
Six-Year	7-12	42	18.0
Four-Year[1]	9-12	98	42.1
Three-Year	10-12	46	19.7
Total[2]		233	99.9

[1]Includes five-year high schools.
[2]Some teachers teach in more than one high school.



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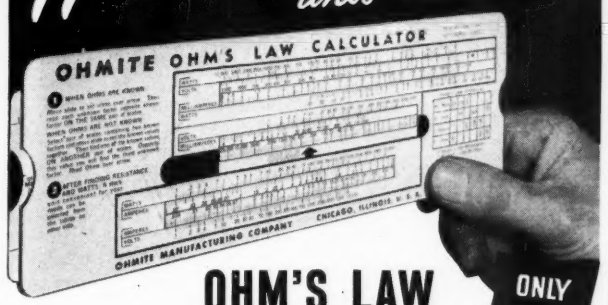

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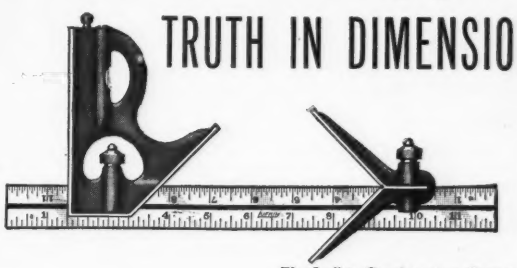

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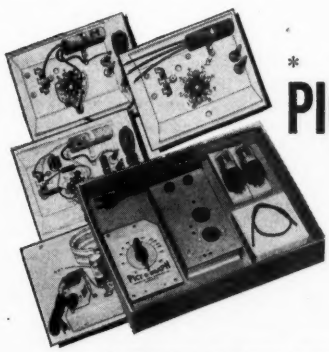

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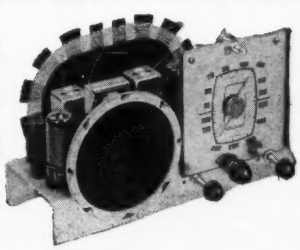

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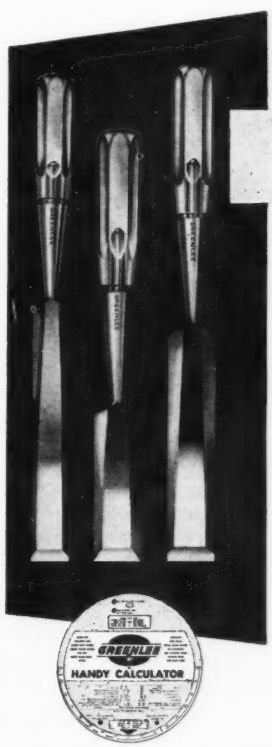

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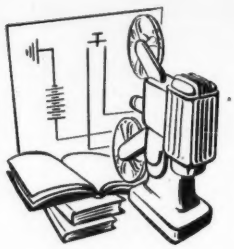

Books:

Industrial Arts in General Education. Wilber. Scranton, Pa.: International Textbook Co., 1948. Pp. xiii + 362. $3.50.

Most of this book is concerned with how to make behavior and thought-process changes in pupils through the industrial-arts program. Specific methods are carefully given for the realization of this objective which is, of course, the core of any educational program. Although it is designed as a teacher-training text, teachers in service will find it valuable as a check on their own procedures and philosophy and as a source of instructional technics. Almost every topic of concern in industrial-arts teaching is covered. Typical chapter headings are "The Relationship of Industrial Arts to General Education," "Starting the Class," "Visual Aids," "Evaluating Results," and "Analysis of Objectives."

Gordon O. Wilber is director, Division of Industrial Arts Teacher Education, State Teachers College, Oswego, N. Y.

Practical Residential Wiring. Nowak. New York: D. Van Nostrand Co., Inc., 1948. Pp. ix + 495. $5.95.

This is a book designed to provide information about safe and practical methods of home wiring. It has information for the home repairman, the farm repairman, the electrical apprentice or helper, the vocational high-school student, the teacher of electrical shopwork, and the building superintendent. All types of installations, repairs, and testing of electrical devices are covered in the text. There are questions at each chapter end and a glossary of terms at the end of the book.

John F. Nowak is Administrator, Veterans' and Reconversion Training Program, Board of Education, New York City.

The Mechanism of the Linotype. Thompson. Brookings, S. D.: Lebawarts, Printers, 1948 (revised thirteenth edition). Pp. ix + 238. $5.00.

This is the standard text for the teaching of linotype mechanism and composition brought down to date. Since the first Mergenthaler lino machine was exhibited in 1883, many changes and improvements have been made. The teaching philosophy behind this revised edition is that by familiarizing the student with the basic mechanism and the present-day version of the linotype it will be possible for him to absorb whatever changes and improvements are made in the future.

There is a biographical sketch of Mergenthaler with descriptions of the various lino models. The text is chiefly in the form of dialogue between the "Machinist" and the "Operator" who discuss the working parts of the machine. Questions at end of each chapter.

Servicing the Modern Car Radio. Hurlbut. New York: Murray Hill Books, Inc., 1948. Pp. vi + 692. $7.50.

Combining repair training and complete working data in one volume, the author presents a book which will enable a good home radio repairman to become a car radio expert. He draws heavily on diagrams, pictures, and tables in order to explain the functioning of different car radios and the idiosyncrasies of each. There are no teaching aids. The major portion of the book is devoted to circuit and alignment data on a cross-section of receivers.

A. L. Hurlbut is a radio service manager and a consultant in radio design.

Plastics Made Practical. Groneman. Milwaukee, Wis.: Bruce Publishing Co., 1948. Pp. x + 324. $4.50.

Designed as a reference guide for elementary work with plastics, this volume is divided into three sections. The first gives general information on the history, development, characteristics, and methods of working plastics. Emphasis is on the acrylics which, of course, are the most popular for school and home shop use. The second part of the book deals with processes in fabricating plastics while the third and largest section covers numerous projects. Photographs and line drawings are used generously throughout the book which will be of interest to industrial-arts teachers wishing to incorporate material on plastics into their program.

Chris H. Groneman is professor of industrial education at the Agricultural and Mechanical College of Texas, College Station.

Pamphlets:

"High School—What's in it for Me?" is a pamphlet prepared for the Commission on Life Adjustment Education for Youth by the U.S. Office of Education. It is a graphic explanation of the philosophy of life adjustment education. The fact that about 60 percent of our high-school students do not get an adequate educational diet in terms of their future roles as consumers, parents, workers, and citizens is pointed out as are certain examples of currently functioning life adjustment educational programs in schools throughout the country. The fallacy of the white-collar myth and the part that many secondary-schools play in perpetuating it is exposed and a plea is made for an acceptance of the fact that we are in reality a "blue-collar" society. Copies of the pamphlet may be procured from the American Technical Society, Drexel at 58th St., Chicago 37, Ill., through whose courtesy the pamphlet is released. Single copies free. Quantity prices on application.

Industrial Arts in Louisiana is a handbook issued by the Louisiana Superintendent of Education John E. Coxe. Sub-titled *A Tentative Program in Industrial Arts on the Secondary Level*, it is intended as a guide for evaluation of present or anticipated industrial-arts education in the state. It comes at a time when Louisiana is embarking on an extensive program of industrial expansion and is intended to aid in the integration of students into the industrial scene. It has many suggestions for building new school shops and for reorganizing old ones. Chapter I, Philosophy and Objectives of Industrial Arts, outlines the role of industrial arts in the general education curriculum and discusses ways and means of implementing its objectives. The remaining chapters outline the various phases of the program in Louisiana, listing instructional aids—bibliographies, charts, films, catalogs, and other materials—for each unit. Available from the State Superintendent of Education, Baton Rouge 4, La. Ask for Bulletin No. 627.

Safety Education in the School Shop is a booklet prepared by the National Safety Council in cooperation with the U. S. Office of Education. The shop safety idea is as old as the school shop, it points out, because whoever teaches correct manipulative skills teaches also shop safety. Safety instruction must be practical, must have little or no relation to passing courses or examinations, the pamphlet explains. Most of the work is devoted to a general discussion of safety rules and safe operation of shops. The role of the teacher, the supervisor, the administrator, and the trainee are all considered. There are many tables of safety hints and regulations and a variety of photographs illustrating correct safety principles. Copies in bulk may be had at cost from the National Safety Council, 20 North Wacker Drive, Chicago 6, Ill., and single copies may be procured from the same source without charge.

Visuals:

The Tools and Rules for Precision Measuring is a 16mm film produced by the L. S. Starrett Co., Athol, Mass., and available for free showing to groups of interested persons. The film features highlights in the history of precision measuring, new tools and instruments recently introduced by the Starrett firm, a survey of precision measuring from basic rules to latest methods, and simplified instruction on the use and reading of the micrometer and vernier. It runs for 30 minutes and is recommended for apprentices, students and their teachers and supervisors. Write to the company and request a showing. Give type of group, its size, your name, position and place of employment.

What Makes a Fine Watch Fine is the title of a new sound motion picture sponsored by the Hamilton Watch Co. It shows the many intricate details of fine watchmaking and points out the differences between fine watches and ordinary ones. The picture, which was produced by the Jam Handy Organization, is available for showing without charge to groups in schools and colleges. Arrangements for the showing should be made through your local Hamilton Watch dealer.

Curiosity Shop is a sound motion picture, available in 16mm and 35mm size, produced by the Aluminum Company of America. The theme of the film is the tirelessness of the pioneers of the laboratories who work to produce better things or to improve a process. Films may be borrowed from the Motion Picture Department, Aluminum Company of America, 801 Gulf Building, Pittsburgh 19, Pa.

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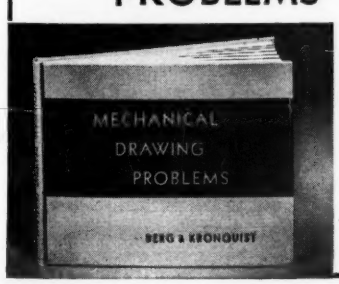

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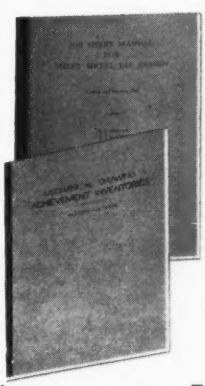

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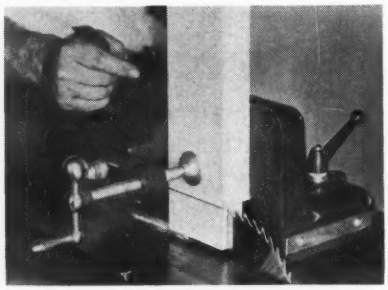
News from INDUSTRY

New Delta Tenoner



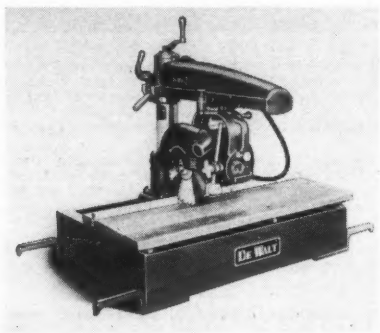
Square, parallel tenons are safely cut on any table saw having a ⅜" x ¾" miter-gage groove, with the Delta tenoner. Work is fed to the saw with one hand—far removed from the revolving blade.

This tenoning jig takes stock up to 2¾" thick in any width within the capacity of the saw. With the addition of spacing collars and an extra saw blade, ¼" or ⅜" tenons can be cut at one pass.

Among the cuts that can be made with the Delta tenoner are: stub tenons, bare-faced tenons, haunched tenons, through-wedged tenons, blind-wedged tenons, mitered tenons, slip-feather miters, end-lapped or housed joints.

Further information may be obtained from Delta Manufacturing Division, 620 E. Vienna Ave., Milwaukee 1, Wisconsin; *or by checking no. 37 on the coupon.*

The DEWALT Saw Shop



DeWalt, Inc., manufacturers of variety woodworking machinery, announce their new low-priced Model GW all-purpose machine. Especially designed for small shops, this new model features a 1 H.P. motor driving a 10"-diameter saw blade. Technical improvements include a heavy-duty four-ball bearing roller travel head riding on machined tracks inside the arm and mechanical aligning adjustments at all moving positions to maintain precision accuracy.

The unit is actually a complete saw shop. Using the proper tool, it becomes a dado machine . . . a gaining machine . . . a grooving machine . . . a rabbeting machine . . . a shaper. Change the cutting tool, and you have another machine!

A free descriptive catalog and prices will be furnished by writing to DeWalt, Inc., 201 Martha Avenue, Lancaster, Pa., mentioning SCHOOL SHOP; *or by checking no. 38 on the coupon.*

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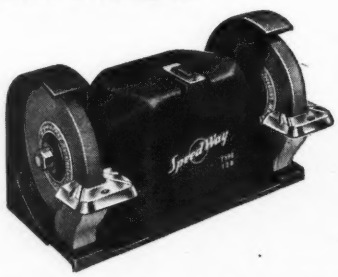

Extremely popular before the war, the redesigned Speedway portable electric bench grinder has been made even more efficient. Its larger motor delivers three times the power of the old model, yet it runs smoothly, silently, and without creeping because of excellent balance. Its light, strong one-piece cast aluminum case houses motor, shaft, and bearings, and provides integral wheel guards and tool rests.

Specifications include: speed 3400 r.p.m.; rating 1/15 HP intermittent duty; motor shaded pole AC; grinding wheels 4½" x ⅜" x ⅜"; voltage 110-120 AC; selfaligning ball bearings; weight 7½ lbs.

For complete description write Dept. S., Speedway Manufacturing Co., Cicero, Ill.; *or check no. 39 on the coupon.*

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2-49

New Literature

They Cover the Field. New two-color, eight-page catalog, describing with photos and specifications on an easy-to-read chart, the complete size range of 13 high-speed DoALL Zephyr band sawing machines. These machines range from a "utility" model weighing 425 pounds with a 16" throat to a powerful precision model weighing 5640 pounds with a 60" throat. Standard and special equipment are illustrated and described. Listed are 62 representative materials that may be contour cut with these machines. To obtain a copy of the catalog, write the DoALL Company, Des Plaines, Illinois, mentioning SCHOOL SHOP; *or check no. 40 on the coupon.*

New South Bend Drill Press Catalog. Both the bench and floor models of the new South Bend 14" precision drill presses are shown in this 7" x 10" catalog. Also illustrated and described are motors, controls, extra spindles, and other drill-press accessories. Complete specifications and prices are listed. Diagrams are used to show all important dimensions of all the drill presses. A copy of catalog No. 400 may be obtained by writing to the South Bend Lathe Works, 181 E. Madison St., South Bend 22, Indiana, mentioning SCHOOL SHOP; *or by checking no. 41 on the coupon.*

Enco Lathe Turrets. A new 16-page catalog No. 48 has been issued by Enco Mfg. Co. Pictorial illustrations showing many typical applications of turrets on actual jobs are particularly interesting. Among the new models shown is the Enco Carriage Hexturret now available for lathes from 9" to 32" swing. Turret selections for particular lathes are simplified by selection charts showing manufacturers' recommendations. Free copy on request from Enco Mfg. Co., 4522-4 Fullerton Ave., Chicago 39, Ill.; *or by checking no. 42 on the coupon.*

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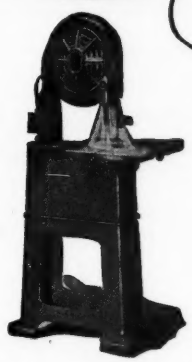

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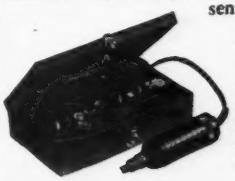

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Washington

from page 32

prospect of filling this gap in view. No one in the federal government is responsible for Training-Within-Industry, which did a herculean job during the last war. Neither is anyone in Washington concerned about training-on-the-job programs.

Roundup of News.—As your reporter made the rounds of Washington agencies he learned at—

The Commerce Department: The plan to hire teachers as enumerators for the 1950 census is still under consideration. About half of the states are expected to take part.

The National Grange: "I go to many state and local Grange meetings. And almost everywhere I hear farmers say they want more practical arts and vocational programs in the public schools," says National Grange Master, Albert Goss.

National Association of Manufacturers: Shop teachers should sponsor more visits to plants and industries, urges Earl Bunting, NAM executive secretary.

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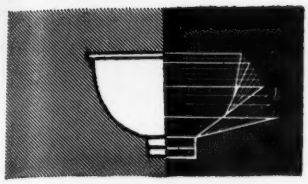

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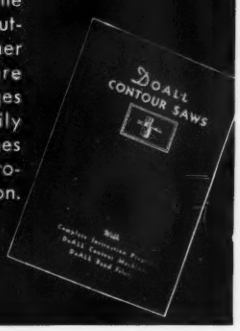

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HERE is what would happen if the Truman program for youth and education were to come into being 100 percent:

Comprehensive Program.—Every shop teacher and his coworker would be covered by social security; federal money would be available not only for vocational courses but also for industrial arts, English, science, music, or any other subject in the curriculum; teacher salaries, because of federal aid, would be a wee bit higher; every school child would have access to some measure of medical care under a compulsory health system; and no pupil would be denied vocational training, or a job in industry for which he was trained, because of race, religion, or place of national origin.

This one, long sentence sums up Mr. Truman's State of the Union message as it applied to education. The next step is for Congressmen to write and introduce specific bills to carry out the President's ideas—which some Republicans called "socialistic." Between now and spring will come committee hearings and committee reports. Only by late spring or summer will Congress take final action on the many proposals which the lawmakers are now throwing into the hoppers.

AVA vs NEA?—The American Vocational Association has demanded that the National Education Association come out with a clear statement that "earmarked funds will not be abolished under a federal aid to education bill." So far, no official response from the general educators. Privately, however, sponsors of federal aid to education, both in and out of NEA, say that "no one has ever proposed that earmarking be abolished . . . the subject has simply never come up for discussion." The AVA, however, charges that proposals to abolish the Smith-Hughes and George-Deen Acts have been made by general educators close to the NEA.

Is open conflict imminent between the 27,000-member AVA (which is politically strong) and the 440,000-member NEA (which is politically stronger than it was last year)?

"In Time of Peace . . ."—The government agency with the most dismal job in Washington is the National Security Resources Board. By law, it must plan for war. Euphemistically, it "advises the President concerning coordination of military, industrial, and civilian mobilization." No one in the NSRB has any idea when, if, or under what conditions war might come. Nevertheless, its staff members must do something to be ready "for the next time." One thing they can do is study our strength and resources. NSRB is not overlooking education. Vocational and trade training is among its concerns.

Therefore, don't be alarmed if your school system is soon asked to survey "the potential" of the vocational education physical equipment. The NSRB asked the U.S. Office of Education to make such a survey and agreed to pay for it. As this is being written, questionnaires are drafted and ready to go, and money for the survey "should be approved momentarily."

How Many Helpers?—Another survey sponsored by the NSRB is already under way. The Labor Department is trying to find out how many apprentices are serving under apprentice agreements, where they are located, their age, the trades to which they are apprenticed, and the ratio of apprentices to journeymen in each occupation.

Labor Department officials estimate without benefit of survey that we have only 350,000 apprentices in registered programs. We need one million. They also say that apprenticeship is still in the age of wood. About half the apprentices are training for carpentry and construction crafts. Meanwhile, our journeymen in all the crafts are getting older—the average age running past 45. Immigration from Europe is no longer supplying craftsmen for American shops. We have to train our own.

Government officials confess their impotence about this critical situation. Only the local employer and the local labor union, aided by local training authorities, can do anything to increase our apprentice supply. One action the federal government can take is to require that every military contract with industry provide for the training of a certain percentage of apprentices. Eight apprentices for each journeyman would be a good ratio, your reporter is told.

More Troubles—As the NSRB looks over the industrial training potential, it finds at least three more weaknesses. Materials for supplementary training of apprentices are still lacking, with no

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